



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,409	04/04/2005	Kenichi Azuma	Q85792	6299
23373 7590 01/09/2008 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			EXAMINER FLANIGAN, ALLEN J	
			ART UNIT 3744	PAPER NUMBER
			MAIL DATE 01/09/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/523,409

Applicant(s)

AZUMA ET AL.

Examiner

Allen J. Flanigan

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5, and 6 are rejected under 35 U.S.C. 102(a, e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Bhagwagar.

Bhagwagar teaches a composition for thermal interface applications including conductive filler particles and silicone polymers, resins or mixtures of silicone resin and polymer. The polymer/resin component is tailored to provide appropriate rheological properties for use as an HSTC, being suitably solid and capable of handling at room temperature and softening at operating temperatures (see paragraphs 55 and 56). The claimed composition is thus

either anticipated or obvious over the conductive polymer composition of Bhagwagar depending on whether Bhagwagar's disclosed compounds will inherently exhibit the modulus recited at 23 °C. As noted in paragraph 26, the first example provides a viscosity of almost 14,000 Pa-s at 30 °C (which is presumed to correspond to a storage modulus of 14K Pa) and of 190 Pa-s at 90 °C. Thus, it seems likely that at 23 °C, the modulus of Bhagwagar's composition would be within the claimed range of 50K pa or larger, and also within the range specified for the temperature range of 50-80 °C. Even if this were not the case, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to adjust the properties of the composition of Bhagwagar as desired to suit the requirements of a particular application in terms of viscoelastic properties desired at room temperature and up to the maximum operating temperatures anticipated. Note that Bhagwagar teaches that the composition can be "formulated to have any desired softening temperature" (abstract). See MPEP 2144.05.

Claims 2, 3, 9, 10, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bhagwagar, particularly in view of Balian et al.

In general, a change of material is considered an obvious modification. In ***Hotchkiss v. Greenwood***, 11 How. 248¹, the Supreme Court held that the "mere substitution of materials" was the "work of a skilled mechanic, not that of the inventor", and thus was unpatentable due to lack of inventiveness, a

characteristic that was codified in the 1952 Patent Act, 35 U.S.C. 103 and is now referred to as "obviousness". Although the teachings of Bhagwagar focus on silicone polymers and resins, the broader teaching suggested by the reference disclosure (Heat Softened Thermally Conductive compositions comprising a mixture of polymers and fillers that can have viscoelastic properties that are temperature dependent and are tailored to a desired range of temperatures) would clearly lead one of ordinary skill in the art to conclude that other suitable materials exhibiting the same transitional characteristics over the desired temperature range would be suitable. Balian et al. specifically teach that styrene block copolymers can be used in compliant thermally conductive compositions. Thus, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to substitute any other suitable polymer material for the silicone resin and/or silicone polymer of Bhagwagar, such being a mere substitution of one known compound for another with predictable results.

Claims 4, 7, 8, 11, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bhagwagar in view of Balian et al. and Mikuni.

The use of additives for the composition of Bhagwagar is discussed, and conventional additives such as antioxidants, wetting agents, flame retardants, etc. are discussed. Another known additive for thermally compliant polymer materials is a tackifier such as a tackifying resin as discussed in Balian et al.

¹ Cited in *Graham v. John Deere*, 148 U.S.P.Q. 459.

Art Unit: 3744

(see abstract). Xylene resin is known as a tackifying agent (see Mikuni paragraph 126), and it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to add such a resin to the polymer of Bhagwagar, particularly where another polymer were to be substituted for the silicone resin (or where the silicone polymer alone were to be used). Bhagwagar, it is noted, teaches that silicone resin provides a tacky property that is useful for such compositions in thermal interface material applications.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


The remaining references teach various composition for thermal interface material applications.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen J. Flanigan whose telephone number is (571) 272-4910. The examiner can normally be reached on M-F 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3744

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Allen J. Flanigan
Primary Examiner
Art Unit 3744

AJF